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RESULTS OF SPRAYING WITH ETHYLENE DIBROMIDE TO CONTROL DOUGLAS-FIR BEETLE IN LOG DECKS

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In early April, 1960, the Division of Timber Management requested the Station to recommend an insecticide for spraying decks of logs infested with the Douglas-fir beetle. The decks were located on a demonstration thinning area on the Hebo Ranger District, Siuslaw National Forest. A water emulsion spray of ethylene dibromide was recommended, with the realization that a high order of control was unlikely because of the inaccessibility of parts of the log decks. On May 27, the writers visited the control site to review the nature of the control problem, and the effectiveness of treatment. Purpose of this report is to record the findings.

The Problem

The control problem developed in a 1-acre area in the Hebo Mountain plantation, which was planted in 1914 and thinned in May, 1959. Thinning was done primarily from below, and some 285 trees of a total of 422 on the 1-acre area were removed. Of the 285 trees removed, 167 were alive; the remaining 118 had died from various causes. The wood removed from the area was divided into three types: commercial-size logs (4 inches and larger), car stakes, and fuel wood. The commercial-size logs were cut up to 32 feet long and were piled at the edge of the thinned area in 2 decks, each about 10 feet high and some 15 feet wide. These logs contained Douglas-fir beetle broods at the time they were piled, and additional attacks occurred after piling. However, no concern was felt because it was planned that the logs would be removed before the beetles flew, which normally occurs about April 1 in this area. It later became apparent, however, that the contractor could not remove the logs before this date. Accordingly, plans were made to treat the logs.

Treatment

The decks were sprayed about April 15 by Ranger District personnel, using spray diverted from the mountain pine beetle control project on the Fremont National Forest. A small engine-driven hydraulic sprayer was used for applying the material. After treatment, the decks were covered with a heavy plastic covering to exclude the rain, and to increase fumigation action of the insecticide.

Effectiveness of the Treatment

To assess effectiveness of the spraying, one of the decks was opened as much as was possible by hand-rolling the piled logs. Bark samples were then removed from several logs and the condition of the beetle broods recorded. Following is a summary of the findings.

1. At the time of spraying, logs contained moderate beetle broods which were in the mature larva, pupa, and new adult stages. Because a large number of the insects were still in immature stages, it appears that many of the attacks in 1959 occurred about midsummer.

2. Broods in logs on the outside of the deck were almost completely killed by the spray. However, a few survivors were found on the extreme bottoms of some exterior logs where spray could not be applied.

3. Many logs near the center of the deck harbored large broods of beetles.

4. In no instance was live brood found under sprayed bark; conversely, brood survival was high in those parts of the logs not covered by spray.

5. Beetles under bark as thick as 1 inch were killed by the spray.

6. It was apparent that the strips of plastic covering had not been effective in creating a fumigation chamber that would allow the chemicals to kill beetles in unsprayed portions of logs. It appears, however, that the plastic was helpful in shedding rain, thus allowing the chemicals to penetrate the bark to a maximum degree. It was reported by District personnel that high winds removed the covering on one occasion.

Conclusions and Recommendations

From the observations made, the following conclusions were reached:

1. The logs contained significant beetle broods at time of spraying.

2. The EDB insecticide killed the beetles wherever it could be applied directly to the bark of logs harboring them. Because spray coverage was incomplete within the decks, it is estimated that somewhat less than half the total beetle population was killed.

3. Spraying decks with EDB is unsatisfactory. To obtain adequate control, it is necessary to spray each log individually.

4. The beetle broods that overwintered in the adult stage have flown from the logs since the time of spraying. Whether they will cause killing in the adjacent green stand is unknown. Those beetle broods that overwintered as larvae probably did not fly until about June 15. According to District Ranger Rolfe Anderson, the logs would be removed before that date.

5. It is recommended that: (a) the trees adjacent to the log deck locations be examined for beetle attacks through the 1960 summer, (b) logs from future thinnings be removed promptly, and (c) any spraying of logs be done before decking.